BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 A drawing of the preferred embodiment (side view) showing major components.

FIG. 2 A detail drawing of components of the preferred embodiment; this is an isometric view of the apparatus for use on rough terrain surfaces according to the invention.

FIG. 3 A detail drawing of the Ski Support Structure.

FIG. 4 A drawing of the Detail view of the Pivot Shaft; an isometric view of a pivot Shaft which acts as a hinge point for the preferred embodiment for use on rough terrain surfaces according to the invention. The pivot Shaft with washer welded at one end and spring clip mounted to other end are shown with pivot Shaft tubes assembly.

FIG. 5 A drawing of a Harness for attendants to pull the transporter.

FIG. 6 A drawing of the folded Transporter for stowing.

FIG. 7 A drawing of the embodiment with ski assembly attached. An isometric view of a Rough Terrain Transporter for use on ice or snow-covered surfaces.

FIG. 8 Four-color pictures of the preferred embodiment in use.

SUMMARY OF THE INVENTION

Referring to the drawings and initially to FIG. 1, the present invention relates to transportation systems and the disabled. The present invention is designed in its preferred embodiment to allow the Rough-Terrain Skiing Transporter to slide over rough snow or ice terrain carrying a disabled or injured individual or materials.

The present invention withstands rugged treatment and is stable due to a low center of gravity and long extension handle base. The present invention is not self-propelled by the user/cargo. Unlike a conventional ski-chair, the attendants power the apparatus independently. The present invention incorporates mechanisms that provide for the assistance of two or more able-bodied attendants.

The present invention is designed for use in rugged environments, including: ski areas, hiking trails, out-of-bounds ski areas, and bush villages in regions like Alaska. The transport apparatus permits disabled people to participate in hiking; camping and other outdoor activities that are currently impossible in the absence of a manual off-road transport system.

The present invention provides the severely disabled user/cargo:

1) A means of traversing rough terrain.

2) A means of stability and balance.

3) Positioning control and smooth comfort during operation.

4) Minimum effects on the body's natural upright orientation on the apparatus.

The apparatus's design also offers a "user/cargo-friendly" portability, which makes transporting and handling the device easy. The lightweight, easy-to-fold structure can be tilted in any orientation when loading or unloading from a vehicle. The entire structure can be disassembled into four pieces each weighing less than 10 lbs. for lightweight travel for distance trekking.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention comprises a Mainframe that is the primary component of the Rough-Terrain Transporter. FIGS. 1-2 show one embodiment of the present invention having a Mainframe (FIG. 1, 11, 22) pivotally connected to the Front Extension Handles 33 and the Ski Support Structure 44.

The Mainframe can take various forms, but typically provides a pair of tubular side frames (FIG. 2, 50, 55, 60, 65) having cross supports 70,75, 90, 105. The Transporter in FIGS. 1-8 shows a preferred design of the present invention. The Mainframe FIG. 1, 11 and rear extension handles comprise continuous tubular members. The tubular members are bent into a loop FIG. 2, 50, and 55 at the rear and interconnected by welded tubular cross members 70, 75, 90 and 105.

The transporter is propelled and maneuvered by two attendants, one at the front of the front extension pull handles 110, 115 and the other at the rear of the rear extension push handles 50, 55. The rear extension push handles extend from the rear of the Seat backrest 95, 100 to the rear of the Mainframe. The space between the backrest and the rear extension push handles cross supports 70, 75 can be used as a place to store a backpack, rescue gear or supplies. The push structure 50, 55 can be grasped by either the lower or upper rear handles by the rear attendant.

The Front Extension Handles 110, 115 comprise a pull structure having horizontal members 120, 125 extending across the front and rear of the Front Extension Handles for

increased stability. The pull structure having vertical aluminum handgrips 130 whereby able-bodied attendants can comfortably ski and laterally stabilize the apparatus. The Handgrip clamps 130 attached to the Front Extension Handles, when grasped by an attendant, thereby enable the attendant to pull more easily for guiding the present invention from the front.

The Front Extension Handles 110, 115 are mounted to the forward most pivot point, the pivot Shaft 90, on the Mainframe and extend forwardly of the Mainframe in a generally horizontal plane. The Shaft 90 will secure the adjacent sections together against whatever sliding force the chair reasonably can be expected to undergo while in use. The ability of the apparatus to flex at the hinge point is helpful to clear an unavoidable obstacle on a path or trail. The footrest of the device clears the ground by seven inches while in operation. The standard design has a frame that is twelve feet long and one-and-one-half feet wide.

The entire present invention would be provided in two sections, one being the Mainframe 50, 55, 60, and 65. A Shaft 90 attaches the second section, the Front Extension Handles 110, 115 to the Mainframe. As shown in detail view FIG. 4, an appropriate Shaft 90 with an over-sized washer 92 is welded on one end to stop the Shaft 90 from sliding through the pivot tubes. And at the opposite end of the pivot tubes, is a spring clip 93 to secure the Shaft 90. The Shaft is inserted into the pivot tubes to allow sections one and two, to

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS (continued)

pivot freely. Similarly, the Ski Support Structure is welded to the pivot tubes 90 to support the preferred embodiment at its hinge point.

Referring to FIG. 3, the present invention has a Ski Support Structure 135, 140, 145, 150. The Ski Mounting Bracket 65 attaches pivotally to the Ski Support at the axel 165. The Axel 165 holds the Ski Support rigid laterally to allow the present invention to steadily slide across the snow. The Ski Shock Absorber 155 attaches between the Ski Support 160 and the Ski Mounting Bracket 65 to dampen vertical movement of the front of the Ski 162.

The present invention has two Shock Absorbers (FIG. 1, 155) one between the Mainframe and Ski Support Structure to provide for a smooth ride for the user/cargo. This first Shock Absorber 155 is attached to the Mainframe beneath the rear of the Seat, in a relatively vertical orientation, between the back of the Ski Support Structure and the base of the Mainframe. The first Shock Absorber 155 provides suspension to the present invention by stabilizing the structure vertically. The First Shock Absorber dampens any oscillating motion from the up-and-down movement that may develop during operation from the attendants pulling and pushing the transporter in a forward direction. A second Shock Absorber 155 is mounted between the ski support structure and the ski to dampen the ski movements vertically.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS (continued)

The configuration of the Mainframe and Front Extension Handles having a pivot Shaft connecting the two structures, section one and section two, enables each individual attendant to determine the attitude of the plane of the Mainframe. Preferably this plane is generally horizontal, as shown in FIG. 1. This horizontal plane will enable the front attendant to position the forward end section 33 at an elevation that is near waist-height Independent of stature of the attendant. With the present invention in this attitude, the attendants will find it easy and convenient to pull the occupied Rough-Terrain Skiing Transporter over rough or uneven terrain without unduly jarring the user/cargo or materials.

In preferred embodiments of the present invention, the Mainframe 11 is designed for carrying a single passenger in the Seat 22. As shown in FIGS. 1-2, the user/cargo sits upright on the Mainframe 11 with legs extending forward. A back support FIG. 2, 95, 100 extends upward from the Mainframe, thereby allowing the user/cargo to sit comfortably in the Mainframe. The Seating is made of thick nylon fabric webbing 170 threaded in a criss-cross manner between the Seat frame sides 95, 100.

In the preferred embodiment a footrest 85 is connected on the lower Mainframe to provide support for the lower extremities and feet of the user/cargo. The user/cargo or materials are secured in the apparatus by safety belts 175 with quick release buckles at the chest, waist and ankle areas. The user/cargo or materials can weigh up to 250 lbs. When balanced the present invention can be easily tipped forward and back and from side to side. This allows the attendants to control the direction of the transporter and to afford the user/cargo great comfort.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS (continued)

The preferred embodiment shown in FIGS. 1-4 comprises side members composed of two side segments (FIG. 2, 50, 55, 60, 65) welded together with interconnecting cross-members. The forward-most section, an open section, comprises the Front Extension Handles welded together with interconnecting cross-members 120, 125. The two sections are joined by adjacent pivot tubes at the front of the Mainframe section, by the Shaft 90. The Mainframe and Front Extension Handles, the Ski Support Structure, and the cross-support members are all metal tubes.

The Shaft of the present invention shown in detail view in FIG. 4 as comprises a solid steel Shaft for insertion into the end of the pivot tubes. This segment would be tubular and of a suitable diameter for fitting the pivot Shaft into the tubes as appropriate. The diameter of the pivot Shaft would be such that bushings made of delrin® can be placed between the Shaft and the tubes to provide for a bearing-like surface. This allows for a fairly non-frictional operation so that the Shaft can pivot within the inside of the pivot tubes. By this arrangement, the longitudinal length and transverse width of the Mainframe sections facilitate tilting the Transporter front to rear and side-to-side with stability during operation.

In operation, the front attendant will proceed to pull the present invention behind him/her. To do so, the attendant will lift the forward end of the forward extension handles so as to raise the handles to waist height. Then as the front attendant pulls the Rough-Terrain Skiing transporter, the rear attendant supports the Mainframe, the Seat and the occupant while balancing the Rough-Terrain Skiing transporter from side to side in coordination

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS (continued) with the front attendant. This coordination of effort between the front attendant and the rear attendant will afford the Rough-Terrain Skiing transporter user/cargo a relatively smooth ride; smooth over rough terrain such as those found at ski runs at ski area, cross-country, wilderness rescue or roadway.

In order for the front and rear attendants to comfortably move the Rough-Terrain Skiing transporter in the position illustrated in FIG. 1, the Mainframe and the front and rear extension handles must be rigid enough to resist impediments so that the attendants need only move the Rough Terrain Skiing transporter in a forward direction.

This requirement necessitates fabricating the Mainframe from relatively rigid, inflexible materials to impart the necessary stiffness and resistance for safe operation of the Rough Terrain Skiing transporter. For rescues and hiking in wilderness uses, where lightweight, strength and durability are important, the frame may be fabricated from chromium molybdenum alloy steel. The Rough-Terrain Skiing-Transporter weighs 43 pounds. An important aspect, however, is that whatever material is chosen, the end product - the Mainframe, Front Extension Handles, and Ski Support Structure must not be made of lightweight or mild steel. Because of the strength of chromium molybdenum alloy steel, there will be little or no noticeable bending of the structure.

The horizontal orientation of the front and rear extension handles allows for operation by front and rear attendants of any stature. Thus the attendants can comfortably operate the present invention so it can sufficiently and adequately clear the ground for most passable

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS (continued)

terrain. The front support structure on the Mainframe comprises a footrest (FIG. 2, 85) for supporting the legs of the user/cargo. One can see, however, that if the Mainframe and Front Extension Handles were too flexible, maneuverability would be limited, especially on steep terrain. Moreover, a too flexible frame could effect an oscillatory bouncing action in the Rough-Terrain Skiing transporter due to the uneven skiing action of the attendants as they pulled and pushed the Rough-Terrain Skiing transporter along.

The present invention can be further equipped with towing Harnesses (FIG.5, 132) when additional pulling power is needed. Shown as a preferred embodiment of a Harness 132 having wide (4 inches) nylon webbing, padded with foam rubber for comfort. The Harness 132 can be used by either or both attendants for greater pulling power or for slowing when going down steep inclines.

The Harness 132 is shown having 1 1/2 inch wide towing straps 133, preferably of nylon webbing, that pull against the posterior pelvic region of an assistant. The Harness 132 is connectable to the Mainframe by strong clips such as mountain climbing carabineers. The carabineers attach to the towing straps 133 at the Mainframe and to the Harness on the posterior pelvic region.

The apparatus of the preferred embodiment provides in FIG. 6 a compact assembly when folded, so that it may easily fit within an elongated space or compartment. When the present invention is to be stowed away, the various segments can be folded together to make a compact, more-easily stowed unit without having to dismantle the sections from

one another. This folding feature adds convenience when loading and unloading the apparatus from a vehicle or storage space.

Other adaptations to the preferred embodiment may include a wide, inflated tire suitable for use on soft snow, soils, sand or soft terrain for recreation or rescue of injured or dead accident victims or transport of equipment off snow. Also, the wheel assembly attachment shown in its embodiment in FIG. 7 can be used for recreational transport off snow. The wheel attachment can be utilized for snow rescues of injured or dead accident victims.

While the preferred embodiment of the invention has been described herein, variations in the design may be made. The scope of the invention, therefore, is only to be limited by the claims appended hereto. The embodiments of the invention in which an exclusive property is claimed are defined herein.

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